Patent claims:

- 1. Method for the thermal treatment of powder paints of any shade applied to substrates for the preparation of a coating on the substrates using IR radiation, characterized in that the powder paint applied to the substrate is irradiated with medium- and/or long-wave IR radiation, and that the powder paint contains additives with the characteristic of absorbing medium- and/or long-wave IR radiation, and that the powder paint which has been thermally treated with medium- and/or long-wave IR radiation is optionally subjected to further treatment with electron or UV radiation.
- 2. Method according to claim 1, characterized in that the powder paint is irradiated with a medium- and/or long-wave IR radiation with a wavelength range of 2 to 12 μm.
- 3. Method according to claim 1 or 2, characterized in that the medium- and/or long-wave IR radiation has a maximum radiation flux density at wavelengths of $> 2.0 \mu m$.
- 4. Method according to claim 3, characterized in that the maximum radiation flux density of the medium- and/or long-wave IR radiation is at wavelengths in the range of 2.0 to 9.0 μm, especially preferably between 2.0 and 6 μm.
- 5. Method according to one of claims 1 to 4, characterized in that the additive with the characteristic of absorbing medium- and/or long-wave IR radiation which is contained in the powder paint is antimony tin oxide and/or indium tin oxide.
- 6. Method according to one of claims 1 to 4, characterized in that the additive with the characteristic of absorbing medium- and/or long-wave IR radiation which is contained in the powder paint is zinc antimonate, vanadium oxide, tin oxide.
- 7. Method according to one of claims 1 to 4, characterized in that the additives with the characteristic of absorbing medium- and/or long-wave IR radiation which are contained in the powder paint are C nanotubes and/or C nanofibers.
- 8. Method according to claim 7, characterized in that the C nanotubes and/or C nanofibers are contained in a quantity in the range of 0.01 wt.% with respect to the total powder paint formulation.

- 9. Method according to one of claims 1 to 4, characterized in that the additives with the characteristic of absorbing medium- and/or long-wave IR radiation which are contained in the powder paint are rare-earth metals and/or oxides of the rare-earth metals or mixtures thereof.
- 10. Method according to claim 9, characterized in that ytterbium oxide and/or neodymium oxide are contained in the powder paint as additives with the characteristic of absorbing medium- and/or long-wave IR radiation.
- 11. Method according to claim 10, characterized in that ytterbium oxide and/or neodymium oxide are contained in the powder paint in a quantity of 2.5 wt.% each with respect to the total powder paint formulation.
- 12. Method according to one of claims 1 to 4, characterized in that the additives with the characteristic of absorbing medium- and/or long-wave IR radiation which are contained in the powder paint are organic substances with a component of hydroxyl groups which is at least 0.5 hydroxyl groups per C atom.
- 13. Method according to claim 12, characterized in that the organic substances are carbohydrates such as cellulose fibers or powder, starch, lactose.
- 14. Method according to claim 12, characterized in that the organic substances are polyalcohols such as pentaerythrite, di-pentaerythrite.
- 15. Method according to one of claims 1 to 14, characterized in that the substrate on which the applied powder paint is irradiated with medium- and/or long-wave IR radiation is three-dimensional.
- 16. Method according to one of claims 1 to 15, characterized in that the substrate on which the applied powder paint is irradiated with medium- and/or long-wave IR radiation is made of thermally insulating material with a thermal conductivity of between 0.05 and 5 W/mK.
- 17. Method according to one of claims 1 to 16, characterized in that the substrate on which the applied powder paint is irradiated with medium- and/or long-wave IR radiation is made of heat-sensitive material.